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November 10, 1993

FCC - MAIL ROOM

Industrial Hygiene InstituteFederal Communications Commission
Washington, DC 20554

(414) 372-7753

In the matter of)
)
 Guidelines for Evaluating the)
 Environmental Effects of) ET Docket No. 93-62
 Radiofrequency Radiation)

Dear Sirs:

The ANSI standard for non-ionizing radiation exposure--ANSI C95.1--was first established in 1966 as a standard to protect against thermal hazard. The historical record shows this clearly and unambiguously.

The ANSI standard so established was considered to be protective against all hazards to health from non-ionizing radiation exposure because only one such hazard was recognized: the thermal hazard (overheating or cooking of tissue).

ANSI C95.1 is based on the assumption that a curve of hazard versus radiation intensity is a monotonically increasing function. This assumption is valid for the thermal hazard; it justifies the imposition of an upper limit on the radiation intensity, which is what the ANSI standard accomplishes.

However, at present there is no basis for assuming that the hazard-versus-intensity curve is monotonically increasing for any nonthermal health hazard. Indeed, there is some experimental evidence to suggest that this function may be roughly Gaussian in shape, with the peak situated three or four orders of magnitude below the limit imposed by the ANSI standard. If this should prove to be correct, it means that the ANSI standard, as it has been promulgated historically, is completely incapable of providing any protection at all against nonthermal health hazards!

Cancer is a nonthermal hazard of radiation exposure. (Cancer cannot possibly be a thermal hazard of such exposure because local heating of tissue is a therapeutic treatment for cancer, because heat kills cancer cells more readily than it kills noncancerous cells.)

What is the evidence that cancer results from long-term exposure to low-intensity non-ionizing radiation? There is a great deal of circumstantial evidence, but there is only one set of data providing direct evidence that cancer is produced as a result of such exposure: the epidemic of cancer that is currently raging among law enforcement officers who have used traffic radar guns for a number of years.

Traffic radar guns emit microwave radiation of very low intensity--well below the ANSI limit--in a continuous beam. The older devices were left running all the time; officers were accustomed to allow the beam to intercept their bodies, sometimes carelessly, sometimes deliberately. The cancers reported in the affected officers always occur at the site of the officer's body where tissue was irradiated by the beam from the traffic radar gun.

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The National Fraternal Order of Police reported--at a Senate Subcommittee hearing held August 10, 1992--that over 160 officers had developed such cancers. This writer calculated the probability that 160 or more officers, nationwide, would have developed cancer at the irradiated body site by chance. The resulting probability is several orders of magnitude smaller than the 5% value at which statistical significance is usually inferred. In other words, the evidence of an association between chronic irradiation of human tissue with very low intensity microwave radiation, and the development of cancer at the irradiated site, is highly statistically significant!

The results of this uncontrolled experiment on law enforcement officers provide strong support for the conclusion that cancer can result from long-term, low-intensity exposure to non-ionizing radiation in the radio-frequency portion of the spectrum, and that this occurs at intensities far below the limit of any ANSI standard ever promulgated. Clearly, the ANSI standard is not capable of protecting against cancer that may be caused by exposure to non-ionizing radiation.

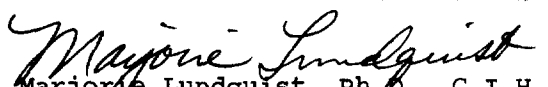
This brings us full circle; back to the historical evidence that the ANSI standard was designed to protect only against thermal damage to tissue. There is a sufficient margin of safety built into the ANSI standard that it doesn't matter whether the limit for protection against thermal hazard is 5 or 10 mW/cm². Both values protect against thermal hazard to virtually the same degree; neither protects against nonthermal hazards at all.

Both the revised and the former ANSI standard provide virtually the same degree of protection against thermal hazard--and the same lack of protection against nonthermal hazard. On a cost-benefit basis, the benefit is virtually the same for the two versions of ANSI C95.1; therefore it is reasonable to make the choice between them on the basis of the cost. Since the cost of compliance with the revised version of ANSI C95.1 is the higher, the standard of choice is the one that the FCC is currently enforcing through its regulations. On this basis, the FCC should not revise its regulations to reflect the revised ANSI standard.

This writer--a certified industrial hygienist--recommends that the FCC not modify its regulations to reflect the revised ANSI C95.1. But, because the public is not protected against cancer as a result of exposure to radio-frequency radiation, it is further recommended that the FCC assemble a panel of individuals to advise it what action to take, and that all further new allocations of the radio-frequency spectrum use be halted as an emergency action, until the circumstances under which such new use may safely proceed have been determined. Such a moratorium on expanded use of the electromagnetic spectrum would assure that the hazard does not continue to increase while the situation is evaluated.

The population in greatest need of additional protection may be amateur radio operators. The changes proposed by the FCC, if the revised ANSI standard were to be adopted, will have a considerable--and expensive--impact upon this population. However, the protection needed is against cancer--which the ANSI standard cannot provide! Therefore the proposed changes to FCC regulations will impose costs upon amateur radio operators, without providing them a commensurate benefit! Since no one at this time knows how to provide the desired protection against cancer hazard, there is little point to imposing the costs of the proposed FCC revisions upon this group.

Yours for safer and more healthful environments,


Marjorie Lundquist, Ph.D., C.I.H.
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Reference:

Nicholas H. Steneck et al. "The Origins of U.S. Safety Standards for Microwave Radiation"
Science 208 (1980) 1230-1236.